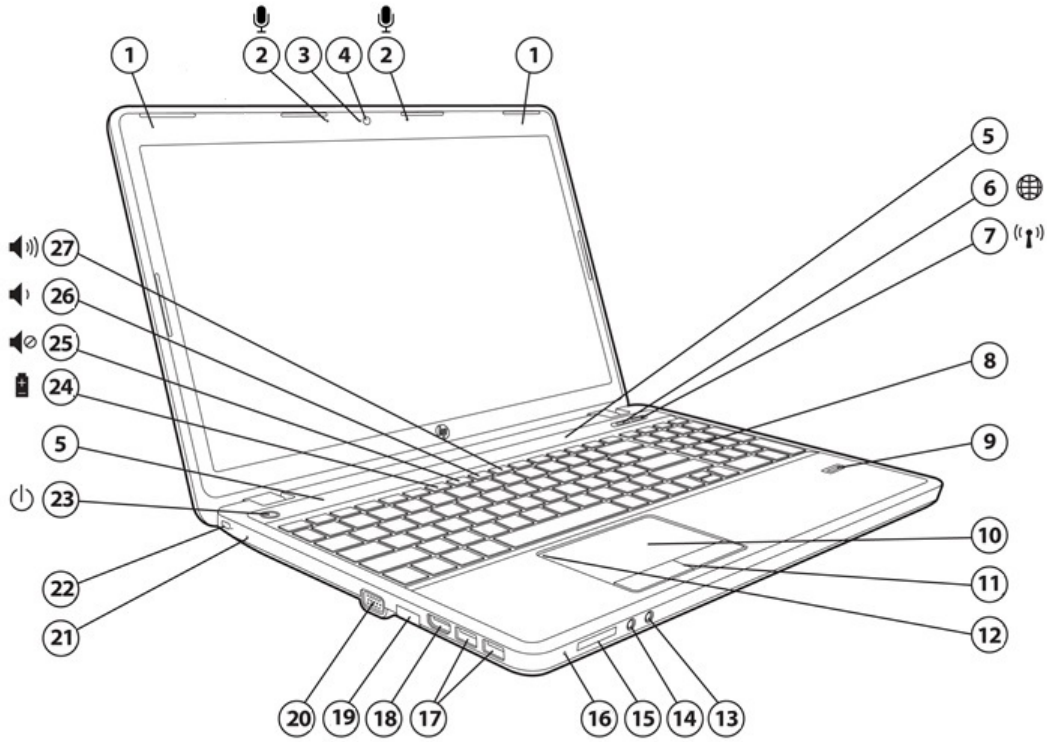
## Overview

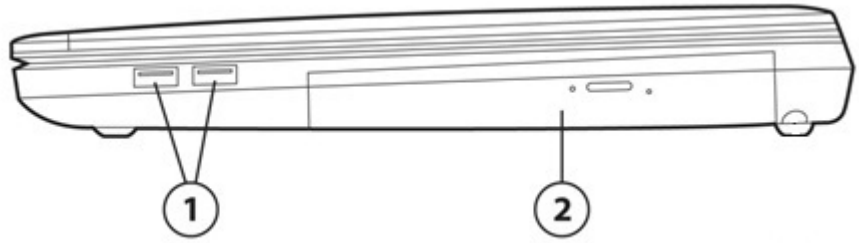



1. WLAN antennas
2. Dual-microphone array*
3. Webcam LED indicator (with optional webcam)
4. Optional 720p HD webcam
5. Stereo speakers
6. HP WebBrowser button with LED indicator
7. Wireless on/off button with LED indicator
8. Numeric keypad
9. HP Fingerprint Sensor
10. Touchpad
11. Touchpad pick buttons
12. Touchpad on/off button with LED indicator
13. Stereo microphone in
14. Stereo headphone/line out
15. Media Card Reader
16. Hard drive activity LED indicator
17. 2 USB 3.0 ports
18. HDMI 1.4a port
19 RJ-45/Ethernet port
20. VGA/external monitor connector
21. AC Adapter/battery light
22. Security cable slot
23. Power button with LED indicator
24. HP Power Assistant function key
25. Volume mute function key
26. Volume down function key
27. Volume up function key

* Models without optional webcam have single integrated microphone on left side of display panel.

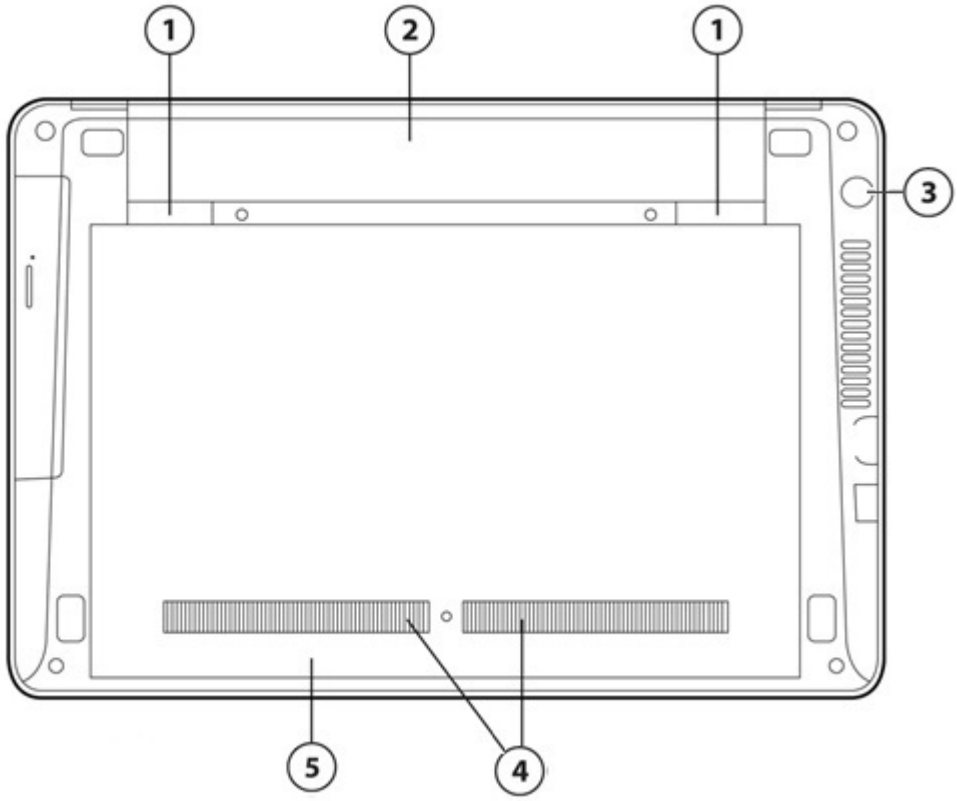
## Overview

Right View




1. 2 USB 2.0 ports
2. Optical drive (select models)

Bottom View




1. Battery and service door release latches
2. Battery bay
3. Power connector
4. Vents
5. Hard drive bay (inside the service door)

Overview

## At A Glance

- Genuine Windows® 7 versions, SUSE Linux Enterprise Desktop 11, or FreeDOS
- Thin, lightweight design with metallic gray brushed aluminum finish for durability and style; wear-resistant HP DuraFinish
- Full-sized spill-resistant keyboard; full separate numeric keypad
- HP 3D DriveGuard to protect hard drive against impact, bumps or drops
- Larger Touchpad with gestures support, on/off button with LED indicator
- Enhanced security features including HP ProtectTools, HP Face Recognition, HP Fingerprint Sensor
- SRS Premium Sound optimized for high fidelity audio
- HDMI port for connecting to high-resolution displays
- ArcSoft TotalMedia Suite for playing, creating, and editing video and audio files
- Optional HD webcam with dual-microphone array for video conferencing
- Widescreen LED-backlit HD display with 16:9 aspect ratio
- 15.6-inch diagonal HD anti-glare
- Accelerated Processing Unit and graphics powered by VISION Pro Technology from AMD
- Models with integrated graphics
- AMD Radeon™ Dual Graphics to automatically manage how the graphics processor in the AMD APU and the AMD Radeon™ discrete graphics processor are used
- HP WebBrowser for convenient online access without the standard boot-up time
- Flexible wireless connectivity options:
  - Integrated 802.11 b/g/n (1x1) wireless LAN module
  - Integrated 802.11 b/g/n (1x1) with Bluetooth 4.0 High Speed (HS) combo card*
- HP Power Assistant to conserve power, increase battery run-time, monitor power needs, report workforce power consumption
- BFR/PVC-free**, ENERGY STAR® qualified and EPEAT TBD registered in the U.S. EPEAT status varies by country- please see epeat.net.

* Available only on select models.
** Meeting the industry definition of 'BFR/PVC-free' per the iNEMI Position Statement on "Low Halogen" Electronics. Plastic parts incorporated into the chassis generally contain < 1000 ppm (0.1%) of bromine or chlorine. Printed circuit board and substrate laminates generally contain < 1500 ppm (0.15%) of total bromine and chlorine. Service parts after purchase may not be BFR/PVC-free. External accessories, including power supplies, power cords, and peripherals as well as the following customer-configurable internal components: ATT SIM card are not BFR/PVC-free.

Features

## OPERATING SYSTEM

| | |
|---|---|
| **Preinstalled** | Genuine Windows 7 Professional 64*<br>Genuine Windows 7 Home Premium 64*<br>Genuine Windows 7 Home Basic 64*<br>SUSE Linux Enterprise Desktop 11<br>FreeDOS |
| **Supported** | Genuine Windows 7 Professional 32*<br>Genuine Windows 7 Home Premium 32*<br>Genuine Windows 7 Home Basic 32*<br>Genuine Windows XP Professional 32 |
| **Certified** | Microsoft WHQL<br>SUSE Linux |

* Not all features are available in all editions of Windows 7. This system may require upgraded and/or separately purchased hardware to take full advantage of Windows 7 functionality. See http://www.microsoft.com/windows/windows-7/ for details.

## ACCELERATED PROCESSING UNIT*

AMD Quad-Core A8-4500M APU with Radeon™ HD 7640G Graphics (2.8 GHz/1.9 GHz, 4 MB L2 cache, 4 cores)
AMD Dual-Core A6-4400M APU with Radeon™ HD 7520G Graphics (3.2 GHz/2.7 GHz, 1 MB L2 cache, 2 cores)
New AMD Dual Core APU with AMD RadeonTM HD 7420G Graphics

* This system requires a separately purchased 64-bit operating system and 64-bit software products to take advantage of the 64-bit processing capabilities of AMD technology. Multi-core processing with AMD technology is designed to improve performance of this system. Given the wide range of SW applications available, performance will vary. AMD's numbering is not a measurement of clock speed.
**NOTE:** APU speed denotes maximum performance mode; APUs will run at lower speeds in battery optimization mode.

## AMD CONTROLLER HUB (CHIPSET)

AMD A70M FCH

## GRAPHICS INCLUDED WITH ACCELERATED PROCESSING UNIT (APU)

Models with integrated graphics
AMD Radeon™ HD 7640G Graphics (with AMD Quad-Core A8-4500M APU)
AMD Radeon™ HD 7520G Graphics (with AMD Dual-Core A6-4400M APU)
AMD Radeon™ HD 7420G Graphics (with new AMD Dual-Core APU)

Features

## DISPLAY

**Internal**
15.6" diagonal LED-backlit HD anti-glare (1366 x 768 resolution)

**External**
Up to 32-bit per pixel color depth
**VGA**
Port supports resolutions up to 2048 x 1536 external resolution @75 Hz
**HDMI**
1.4 port supports up to 1080p, 1920 x 1080 at 60Hz
**NOTE:** Resolutions are dependent upon monitor capability, and resolution and color depth settings.

## STORAGE AND DRIVES

**Primary Storage Bay**
**Hard Drives**
320/500/750 GB 7200 rpm SMART SATA II
**3D DriveGuard (Windows only)**
The hard drive is mounted directly to the notebook frame, reducing the transmission of shock to the hard drive

**NOTE:** Up to 19 GB is reserved for the system recovery software.

## OPTICAL DRIVES

**Fixed 12.7 mm SATA optical drive**
Blu-ray ROM DVD+/-RW SuperMulti DL Drive
DVD+/-RW SuperMulti DL Drive
**Weight saver**

## MEMORY

**Standard**
DDR3 PC3-10600 SDRAM (1333 MHz)*
Two SODIMM slots supporting dual-channel memory
2 GB and 4 GB SODIMMs
**Maximum**
Upgradeable to 8192 MB with optional 4096 MB SODIMMs in slots 1 and 2
**Dual-channel**
Maximized dual-channel performance requires SODIMMs of the same size and speed in both memory slots.

* Maximum memory speed supported by the system may be 1333 MHz or 1066 MHz.
**NOTE:** Due to the non-industry standard nature of some third-party memory modules, we recommend HP branded memory to ensure compatibility. If you mix memory speeds, the system will perform at the lower memory speed. With Windows Starter 32-bit operating systems, the amount of usable memory is dependent upon your configuration, so that above 3 GB all memory may not be available due to system resource requirements.

Features

## NETWORKING/COMMUNICATIONS

**Wireless**

Support for a broad range of secure, integrated wireless LAN options featuring support for the latest industry standards.. Integrated Bluetooth is also available (factory configurable only) and can be combined with any of the supported wireless.

**All 802.11 integrated wireless LAN options**

802.11b/g/n (1x1)
802.11b/g/n (1x1) with Bluetooth® v4.0 combo

**Communications**

Integrated Realtek 10/100/1000 Ethernet Controller*
* The term "10/100/1000" or "Gigabit" Ethernet indicates compatibility with IEEE standard 802.3ab for Gigabit Ethernet, and does not connote actual operating speed of 1 Gb/s. For high-speed transmission, connection to a Gigabit Ethernet server and network infrastructure is required.

## AUDIO/MULTIMEDIA

**Audio**

SRS Premium Sound™
Integrated stereo speakers
Integrated microphone (dual-microphone array when equipped with optional webcam)
Function keys for volume mute, volume up, volume down; play, rewind, and fast-forward of video and audio files
Stereo headphone/line out

**Webcam**

Optional 720p HD webcam

- HD format (widescreen)
- Supports videoconferencing and still image capture
- High quality fixed focus lens
- Video capture at various resolutions up to 1280x720 resolution (720p) and up to 30fps
- M-JPEG compression supports higher frame rates for video capture and videoconferencing
- Improved low light sensitivity
- Improved dynamic range

Features

## KEYBOARDS/POINTING DEVICES/BUTTONS & FUNCTION KEYS

**Keyboard**

The HP spill-resistant keyboard is designed using a thin layer of Mylar film under the keyboard and a drain system that funnels fluid through a hole in the bottom of the notebook. This minimizes the risk of damage to sensitive components underneath. The 101/102-key compatible keyboard features a full-pitch key layout with desktop keyboard features, such as editing keys, both left and right control and alt keys, and function keys. US and International key layouts are available. The HP ProBook 4545s includes a separate numeric keypad.

**Pointing Devices**

Touchpad with gestures support, on/off button with LED indicator, two-way scroll, two pick buttons

**Buttons and Function Keys**

Separate launch buttons provide easy access to wireless on/off and HP WebBrowser. Function keys provide control of features including: standby mode, display brightness, external display, HP Power Assistant, volume mute, volume down, volume up, and media control.

## SOFTWARE AND SECURITY

**Preinstalled Software with Windows Operating System**

HP Recovery Manager
HP Support Assistant
HP Hotkey Support
HP WebBrowser
HP Power Assistant
HP Connection Manager
ArcSoft Total Media Suite
Microsoft® Office Starter: reduced-functionality Word and Excel® only, with advertising. No PowerPoint® or Outlook®.
Buy Office 2010 to use the full-featured software.
WinZip

**NOTE:** HP Recovery Manager enables fast recovery of the factory preinstalled image if the system becomes corrupted or if important system files are accidentally deleted. Up to 19 GB of the hard drive is reserved for the system recovery software. Support in Windows Operating System only.

* Includes reduced functionality versions of Word and Excel. Purchase of Product Key required to activate full Office 2010 suite available at participating resellers/retailers and http://www.office.com.

**Security**

**Standard**

HP ProtectTools
Drive Encryption for HP ProtectTools
HP ProtectTools Security Manager
HP Spare Key
File Sanitizer for HP ProtectTools
HP Face Recognition
HP File Sanitizer
HP Fingerprint Sensor
Security Lock slot

**Optional**

Security Lock

**NOTE:** Computrace agent is shipped turned off, and must be activated by customers when they purchase a subscription.

Features

Subscriptions can be purchased for terms ranging from one to five years. Service is limited, check with Absolute for availability outside the U.S.

For more information on HP security solutions refer to: http://www.hp.com/go/security.

## POWER

**Power Supply**

External 65-watt Smart AC adapter (integrated graphics)
Power cord included is 6-foot (1.8 meter).
Total length including external AC adapter is 12 feet (3.66 meter).
HP Fast Charge (6-Cell only)

**Primary Battery**

HP 9-cell Lithium-Ion Battery (93 WHr)
HP 6-cell Lithium-Ion Battery (47 WHr)

**Battery Life**

Battery life up to TBD hours*

**System Standby Time**

Up to 1 week

*Battery life will vary depending on the product model, configuration, loaded applications, features, use, wireless functionality and power management settings. The maximum capacity of the battery will naturally decrease with time and usage. See MobileMark07 battery benchmark http://www.bapco.com/products/mobilemark2007 for additional details.
**NOTE:** Fast Charge recharges your battery up to 90% within 90 minutes when the system is off. Please note that Fast Charge is only available on 9-cell batteries.

**Power Conservation**

Supports enhanced Intel SpeedStep technology (allows Battery Optimized Mode, Maximum Performance Mode, or Automatic mode)
ATI PowerPlay technology
Hibernation
Standby
ACPI compliance

## ENVIRONMENTAL

ENERGY STAR
IT ECO Declaration
EPEAT Gold where HP registers commercial notebook products. See http://www.epeat.net for registration status in your country.

**NOTE:** This product has received or is in the process of being certified to the following approvals and may be labeled with one or more of these marks.

Features

## WEIGHTS & DIMENSIONS

**Weight**
Starting at 5.14 lb (2.33 kg) without optical drive
Starting at 5.45 lb (2.47 kg) with optical drive

**Dimensions** (w x d x h)
14.76 x 10.09 x 1.4 in (at front)
37.5 x 25.6 x 3.5 cm (at front)

**NOTE:** Height varies depending upon where on the notebook the measurement is made. Weight varies by configuration and components. Weight includes 6-cell battery, hard drive, 1 GB memory, and optical drive. Weight varies by configuration and components.

## PORTS/SLOTS

**Ports**

VGA - One
USB 3.0- Two
USB 2.0 - Two
HDMI 1.4a - One
Stereo microphone in - One
Stereo headphone/line out - One
Power Connector - One
RJ-45 (Ethernet) - One

**Digital Media Slots**
1 Multi-media Reader Slot supporting SD, SDHC, SDXC, MMC, MMC+, Memory Stick

## SERVICE AND SUPPORT

HP Services offers limited 3-year, 1-year and 90-day warranty options depending on country. Warranty upgrades are also available. HP Care Pack Services extend service contracts beyond the standard warranties. To choose the right level of service for your HP product, use the HP Care Pack Services Lookup Tool at: http://www.hp.com/go/lookuptool. Additional HP Care Pack Services information by product is available at: http://www.hp.com/services/carepack.

**NOTE:** Certain restrictions and exclusions apply. Consult the HP Customer Support Center for details. http://h20000.www2.hp.com/bizsupport/TechSupport/ProductRoot.jsphttp://h20000.www2.hp.com/bizsupport/TechSupport/ProductRoot.jsp

## SYSTEM UNIT

| | | |
|---|---|---|
| **Stand-Alone Power Requirements** (AC Power) | **Nominal Operating Voltage** | 18.5 V |
| | **Average Operating Power** | Integrated graphics: TBD W |
| | **Max Operating Power** | < 65W |
| **Temperature** | **Operating** | 32° to 95° F (0° to 35° C) (not writing optical)<br>41° to 95° F (5° to 35° C) (writing optical) |
| | **Non-operating** | -4° to 140° F (-20° to 60° C) |
| **Relative Humidity** | **Operating** | 10% to 90%, non-condensing |
| | **Non-operating** | 5% to 95%, 101.6° F (38.7° C) maximum wet bulb temperature |
| **Shock** | **Operating** | 40 G, 2 ms, half-sine |
| | **Non-operating** | 200 G, 2 ms, half-sine |
| **Random Vibration** | **Operating** | 0.75 grms |
| | **Non-operating** | 1.50 grms |
| **Altitude** (unpressurized) | **Operating** | -50 to 10,000 ft (-15.24 to 3,048 m) |
| | **Non-operating** | -50 to 40,000 ft (-15.24 to 12,192 m) |
| **Planned Industry Standard Certifications** | **UL** | Yes |
| | **CSA** | Yes |
| | **FCC Compliance** | Yes |
| | **ENERGY STAR®** | Select models* |
| | **EPEAT** | Registered TBD in United States** |
| | **ICES** | Yes |
| | **Australia / NZ A-Tick Compliance** | Yes |
| | **CCC** | Yes |
| | **Japan VCCI Compliance** | Yes |
| | **KC** | Yes |
| | **BSMI** | Yes |
| | **CE Marking Compliance** | Yes |
| | **BNCI or BELUS** | Yes |
| | **CIT** | Yes |
| | **GOST** | Yes |
| | **Saudi Arabian Compliance (ICCP)** | Yes |
| | **SABS** | Yes |
| | **UKRSERTCOMPUTER** | Yes |

Technical Specifications

* Configurations of the HP ProBook 4545s that are ENERGY STAR qualified are identified as HP ProBook 4545 ENERGY STAR on HP websites and on www.energystar.gov.
** EPEAT registration varies by country. See www.epeat.net for registration status by country.
EPEAT status listed above applies to U.S.

For accessibility information on HP products, please visit: http://www.hp.com/accessibility.

## DISPLAY

| | | | |
|---|---|---|---|
| **15.6-inch LED HD (1366 x 768) anti-glare** | **Dimensions** (W x H) | 13.54 x 7.59 in (34.4 x 19.4 cm) | |
| | **Diagonal Size** | 15.6 in (39.6cm) | |
| | **Surface Treatment** | Anti-glare | |
| | **Contrast Ratio** | 400:1 (min) | |
| | **Refresh Rate** | 60 Hz | |
| | **Brightness** | 210 nit (typical) | |
| | **Pixel Resolution** | **Pitch** | 0.252 mm |
| | | **Format** | 1366 x 768 |
| | | **Configuration** | RGB Stripe |
| | **Backlight** | LED | |
| | **PPI** | 101 ppi | |
| | **Viewing Angle** | ±30° Horizontal, ±10° Vertical (minimum)<br>30/30/20/10 (Left/Right/Down/Up) (minimum) or<br>45/45/35/25 (Left/Right/Down/Up) (typical) | |

## STORAGE AND DRIVES

**Internal Storage**

## Technical Specifications

| | | | |
|---|---|---|---|
| **750 GB 7200 rpm SATA Hard Drive** | **Drive Weight** | 0.25 lbs (115g) | |
| | **Capacity** | 750 GB | |
| | **Height** | 0.37 in (9.5 mm) | |
| | **Width** | 2.75 in (70 mm) | |
| | **Interface** | ATA-8, SATA 2.6, 3.0 Gb/s, NCQ | |
| | **Transfer Rate** | **Synchronous** (maximum) | 300 MB/s (Drive Capability) |
| | **Seek Time** (typical reads, including settling) | **Single Track** | 1.5 ms |
| | | **Average** | 11 ms |
| | | **Maximum** | 22 ms |
| | **Rotational Speed** | 7200 rpm | |
| | **Logical Blocks** | 1,465,149,168 | |
| | **Operating Temperature** | 32° to 140° F (0° to 60° C) [case temp] | |
| | **Features** | ATA Security | |

| | | | |
|---|---|---|---|
| **500 GB 7200 rpm SATA Hard Drive** | **Drive Weight** | 0.25 lbs (115g) | |
| | **Capacity** | 500 GB | |
| | **Height** | 0.37 in (9.5 mm) | |
| | **Width** | 2.75 in (70 mm) | |
| | **Interface** | ATA-8, SATA 2.6, 3.0 Gb/s, NCQ | |
| | **Transfer Rate** | **Synchronous** (maximum) | 300 MB/s (Drive Capability) |
| | **Seek Time** (typical reads, including settling) | **Single Track** | 1.5 ms |
| | | **Average** | 11 ms |
| | | **Maximum** | 22 ms |
| | **Rotational Speed** | 7200 rpm | |
| | **Logical Blocks** | 976,773,168 | |
| | **Operating Temperature** | 32° to 140° F (0° to 60° C) [case temp] | |
| | **Features** | ATA Security | |

## Technical Specifications

| | | | |
|---|---|---|---|
| **320 GB 7200 rpm SATA Hard Drive** | **Drive Weight** | 0.25 lbs (115 g) | |
| | **Capacity** | 320 GB | |
| | **Height** | 0.37 in (9.5 mm) | |
| | **Width** | 2.75 in (70 mm) | |
| | **Interface** | ATA-8, SATA 2.6, 3.0 Gb/s, NCQ | |
| | **Transfer Rate** | **Synchronous** (maximum) | 300 MB/s (Drive Capability) |
| | **Seek Time** (typical reads, including settling) | **Single Track** | 1.5 ms |
| | | **Average** | 11 ms |
| | | **Maximum** | 22 ms |
| | **Rotational Speed** | 7200 rpm | |
| | **Logical Blocks** | 625,142,448 | |
| | **Operating Temperature** | 32° to 140° F (0° to 60° C) [case temp] | |
| | **Features** | ATA Security | |

| | | | |
|---|---|---|---|
| **Optical Drives** | | | |
| **DVD+/-RW SuperMulti DL Drive** | **Access Times** | Random | <140ms CD (typical)<br>< 160 ms DVD (typical) |
| | **Max Data Transfer Rate** | 24X CD-ROM<br>8X DVD<br>24X CD-R<br>24X CD-RW<br>8X DVD+R<br>8X DVD+RW<br>8X DVD-R<br>6X DVD-RW<br>6X - DVD+R Dual Layer<br>6X - DVD-R Dual Layer<br>5X DVD-RAM | |
| | **Transfer Mode** | UDMA Mode 5 | |
| | **Interface** | Gen 1 SATA | |
| | **Supported Media** (read) | CD-DA, CD-TEXT, CD-ROM, CD-ROM XA, MIXED MODE CD, CD-I, CD-I Bridge (Photo-CD, Video CD), Multisession CD (Photo-CD, CD-EXTRA, Portfolio, CD-R, CD-RW), CD-R, CD-RW, DVD-ROM (DVD-5, DVD-9, DVD-10, DVD-18), DVD-R, DVD-RW, DVD+R, DVD+RW, DVD-RAM | |
| | **Supported Media** (write) | CD-R, CD-RW, DVD+R, DVD+RW, DVD-R, DVD-RW, DVD-RAM, DVD+R DL, DVD-R DL | |
| | **Max Media Capacity** (read) | 8.5 GB | |
| | **Max Media Capacity** (write) | 8.5 GB | |
| | **Transport** | Tray Loading | |

| | | | |
|---|---|---|---|
| **Blu-ray ROM DVD+/-RW SuperMulti DL Drive** | **Access Times** | Random | <190 ms CD-ROM (typical)<br>< 180ms DVD-ROM (typical)<br><230 ms BD-ROM (typical) |
| | **Max Data Transfer Rate** | 24X CD-ROM<br>8X DVD-ROM<br>24X CD-R<br>16X CD-RW<br>8X DVD+R<br>8X DVD+RW<br>8X DVD-R<br>6X DVD-RW<br>4X - DVD+R Dual Layer<br>4X - DVD-R Dual Layer<br>5X DVD-RAM<br>6X BD-ROM | |
| | **Transfer Mode** | UDMA Mode 5 | |
| | **Interface** | Gen 1 SATA | |
| | **Supported Media** (read) | CD-DA, , CD-TEXT, CD-ROM, CD-ROM XA, MIXED MODE CD, CD-I, CD-I Bridge (Photo-CD, Video CD), Multisession CD (Photo-CD, CD-EXTRA, Portfolio, CD-R, CD-RW), CD-R, CD-RW, DVD-ROM (DVD-5, DVD-9, DVD-10, DVD-18), DVD-R, DVD-RW, DVD+R, DVD+RW. DVD-RAM, BD-ROM, BD-R, BD-RE | |
| | **Supported Media** (write) | CD-R, CD-RW, DVD+R, DVD+R DL, DVD+RW, DVD-R, DVD-R DL, DVD-RW, DVD-RAM | |
| | **Max Media Capacity** (read) | 50.0 GB | |
| | **Max Media Capacity** (write) | 8.5GB | |
| | **Transport** | Tray Loading | |

## SECURITY

Technical Specifications

| | | |
|---|---|---|
| **HP Fingerprint Sensor** | **Mobile Voltage Operation** | 3.0V-3.6V Single Supply |
| | **Operating Temperature** | 32° - 158°F (0° - 70°C) |
| | **Current Consumption @ 3.3V** | Less than 70 mA peak imaging and scrolling<br>Less than 25 mA hardware finger detection<br>Advanced Power Management |
| | **High-Rate Image Capture** | Up to 240 image frames /sec |
| | **ESD Resistance** | IEC 61000-4-2 Level 4 (±15KV) |
| | **Detection Matrix** | 192 x 16 Pixels<br>9.7 mm x 0.81 mm<br>500 ppi High-Resolution Images |

## NETWORKING/COMMUNICATIONS

| | | |
|---|---|---|
| **Integrated Realtek RTL8151FH-CG 10/100/1000 NIC** | **Ethernet Features** | 10 Mbit/s operation (10BASE-T; IEEE 802.3i; IEEE 802.3 clauses 13-14)<br>100 Mbit/s operation (100BASE-TX; IEEE 802.3u; IEEE 802.3 clauses 21-30)<br>1000 Mbit/s operation (1000BASE-T; IEEE 802.3ab; IEEE 8023 clauses 40)<br>Auto-Negotiation (Automatic Speed Selection)<br>Full Duplex Operation at all Speeds, Half Duplex operation at 10 and 100 Mbit/s<br>IEEE 802.1p QoS (Quality of Service) Support<br>IEEE 802.1q VLAN support<br>IEEE 802.3x Flow Control (IEEE 802.3 clauses 31-32; configurable)<br>IEEE 802.3az EEE (Energy Efficient Ethernet)<br>Jumbo Frame 9K<br>Auto MDI/MDIX Crossover cable detection |
| | **Power Management Support** | ACPI compliant - multiple power modes<br>Situation-sensitive features reduce power consumption<br>Advanced link down power saving for reducing link down power consumption |
| | **Performance Features** | TCP/IP/UDP Checksum Offload (configurable)<br>Protocol Offload (ARP & NS)<br>Large send offload and Giant send offload<br>Receiving Side Scaling |
| | **Manageability** | Wake-on-LAN from standby and hibernation (Magic Packet and Microsoft Wake-Up Frame); Wake-on-LAN from off (Magic Packet only)<br>PXE 2.1 Remote Boot<br>Statistics Gathering (SNMP MIB II, Ethernet-like MIB, Ethernet MIB (802.3x, clause 30))<br>Comprehensive diagnostic and configuration software suite<br>Virtual Cable Doctor for Ethernet cable status |
| | **Interface** | PCI Express 1.1 x1 to fully support ASPM L0s/L1 and CLKREQ |
| | **NIC Device Driver Name** | Realtek PCIe GBE Ethernet Family Controller |

| | | |
|---|---|---|
| **802.11 b/g/n WiFi Adapter (1x1)** | **Wireless LAN Standards** | IEEE 802.11b<br>IEEE 802.11g<br>IEEE 802.11n |

Technical Specifications

| | | |
|---|---|---|
| **Interoperability** | Wi-Fi certified | |
| **Frequency Band** | 2.4 GHz | |
| **Data Rates** | 802.11b: 1, 2, 5.5, 11 Mbps<br>802.11g: 6, 9, 12, 18, 24, 36, 48, 54 Mbps<br>802.11n: many possible data rates, ranging from 6 Mbps to 300 Mbps, depending on the combination of Bandwidth, Modulation Coding Scheme, and Guard Interval used, as defined in IEEE 802.11n specification | |
| **Modulation** | Direct Sequence Spread Spectrum<br>DBPSK, DQPSK, CCK, OFDM, BPSK, QPSK, 16-QAM, 64-QAM | |
| **Security**[1] | Supports 64- and 128-bit WEP, WPA, WPA2, hardware-accelerated AES, 802.1x authentication types EAP-TLS, EAP-TTLS, PEAP-GTC, PEAP-MSCHAPv2, LEAP, EAP-FAST. | |
| **Sub-channels** | Multinational support with frequency bands and channels compliant to local regulations. | |
| **Media Access Protocol** | CSMA/CA (Collision Avoidance) with ACK | |
| **Network Architecture Models** | Ad-hoc (Peer to Peer)<br>Infrastructure (Access Point Required) | |
| **Roaming** | IEEE 802.11 compliant roaming between access points | |
| **Output**2 | 13.5 dBm, nominal | |
| **Power Consumption** | Transmit: 2.0 W (max)<br>Receive: 1.6 W (max)<br>Associated to Access Point, Idle: 250 mW nominal<br>Wireless Button Off: 100 mW nominal<br>Radio disabled: 75 mW nominal | |
| **Power Management** | ACPI compliant power management<br>802.11 compliant power saving mode | |
| **Receiver Sensitivity**[3] | 72.2 Mbps: -70 dbm, 54 Mbps: -74 dBm, 11 Mbps: -88 dBm , 1 Mbps: -95 dBm | |
| **Antenna Connections** | High efficiency antenna with spatial diversity, mounted in the display enclosure | |
| **Form Factor** | PCI-Express Half-MiniCard 1.2 | |
| **Weight** | 0.013 lb (6 g) | |
| **Dimensions** | 0.19 x 1.06 x 1.18 in (4.75 x 26.8 x 30 mm) | |
| **Operating Voltage** | 3.3v +/- 9% | |
| **Temperature** | Operating<br>Non-operating | 14° to 158° F (-10° to 70° C)<br>-40° to 176° F (-40° to 80° C) |
| **Humidity** | Operating<br>Non-operating | 10% to 90% (non-condensing)<br>5% to 95% (non-condensing) |
| **Altitude** | Operating<br>Non-operating | 0 to 10,000 ft (3,048 m)<br>0 to 50,000 ft (15,240 m) |
| **LED Activity** | LED Off - Radio OFF; Solid LED On - Radio ON | |

1. Check latest software/driver release for updates on supported security features.
2. Maximum output power may vary by country according to local regulations.
3. Receiver sensitivity is measured at a packet error rate of 8% for 802.11b (CKK modulation) and a packet error rate of 10% for 802.11a/g (OFDM modulation).

## AUDIO/MULTIMEDIA

| | | |
|---|---|---|
| **Hardware** | **Implementation** | IDT 92HD87 High Definition CODEC |
| | **Function Key Volume Controls** | Volume up, volume down, and mute |
| | **Full Duplex** | Yes |
| | **Microphone In** | Stereo |
| | **Headphone/Line Out** | Stereo |
| | **Integrated Microphone** | Yes, dual digital microphone array when equipped with optional webcam |
| **Audio Output Quality** | **Frequency Response** | 20 Hz - 20 kHz |
| | **Signal to Noise Ratio** | >85 dB |
| | **Total Harmonic Distortion** | 0.01% |
| | **Noise Floor** | -110 dB |
| | **Play/Record Sampling Rate**(s) | 8 kHz - 48kHz |
| | **DAC** | 16, 20 or 24-bit |
| | **ADC** | 16 or 20-bit |
| **Internal Stereo Speaker** | **Power Rating** | 2 Watts |
| | **Impedance** | 4 ohms |

## POWER

## Technical Specifications

| | | | |
|---|---|---|---|
| **HP 65W Smart AC Adapter** | **Dimensions** | 4.17 x 1.85 x 1.1 in (10.6 x 4.7 x 2.8 cm) | |
| | **Weight** | 0.62 lb (280 g) | |
| | **Input** | 100 to 240 VAC | |
| | | **Input Efficiency** | 87% min at 115 VAC |
| | | **Input frequency range** | 47 to 63 Hz |
| | | **Input AC current** | 1.7 A at 90 VAC, 0.85 A at 180 VAC |
| | **Output** | **Output power** | 65W |
| | | **DC output** | 18.5V |
| | | **Hold-up time** | 5 msec at 115 VAC input |
| | | **Output current limit** | <11A, Over voltage protection- 29V max automatic shutdown |
| | **Connector** | 3 pin/grounded, mates with interchangeable cords | |
| | **Environmental Design** | **Operating temperature** | 32° to 104° F (0° to 40° C) |
| | | **Non-operating (storage) temperature** | -4° to 149° F (-20° to 65° C) |
| | | **Altitude** | 0 to 10,000 ft (0 to 3,048 m) |
| | | **Humidity** | 20% to 80% |
| | | **Storage Humidity** | 10% to 90% |
| | **EMI and Safety Certifications** | CE Mark - full compliance with LVD and EMC directives; Worldwide safety standards - IEC60950, EN60950, UL60950, Class1, SELV; Agency approvals - C-UL-US, NORDICS, DENAN, EN55022 Class B, FCC Class B, CISPR22 Class B, CCC, NOM-1 NYCE; MTBF - over 200,000 hours at 25°C ambient condition. | |
| **9-Cell (93 WHr) Lithium-Ion battery** | **Dimensions** (H x W x L) | 0.8 x 2.9 x 8.3 in (2.0 x 7.3 x 21.0 cm) | |
| | **Weight** (max) | 1.07 lb (0.488 kg) | |
| | **Cells/Type** | 9-cell Lithium-Ion | |
| | **Energy** | **Watt-hour capacity** | 93 WHr |
| | **Temperature** | **Operating (Charging)** | 32° to 113° F (0° to 45° C) |
| | | **Operating (Discharging)** | 14° to 140° F (-10° to 60° C) |
| | | **Non-operating** | -4° to 140° F (-20° to 60° C) |
| | **Battery Re-Charge Time** | **System in OFF or Standby Mode** | 3 to 4 hours |
| | | **System ON** | 4 to 6 hours (depending on system power consumption) |

Technical Specifications

| | | | |
|---|---|---|---|
| **6-Cell (47 WHr) Lithium-Ion battery** | **Dimensions** (H x W x L) | 0.8 x 1.8 x 10.4 in (2 x 4.5 x 26.5cm) | |
| | **Weight** (max) | .70lb, (.312kg) | |
| | **Cells/Type** | Lithium-Ion | |
| | **Energy** | **Voltage** | 10.8V |
| | | **Amp-hour capacity** | 4.4Ah |
| | | **Watt-hour capacity** | 47Wh |
| | **Temperature** | **Operating (Charging)** | 32° to 113° F (0° to 45° C) |
| | | **Operating (Discharging)** | 14° to 122° F(-10° to 50° C) |
| | | **Non-operating** | -4° to 122° F (-20° to 50° C) |
| | **Battery Re-Charge Time** | **System in OFF or Standby Mode** | 2.5 hours |
| | | **System ON** | 3 to 5 hours |
| | **Fuel Gauge LED** | No | |
| | **Warranty** | 1 year | |
| | **Compatible with optional Travel Battery** | No | |

## ENVIRONMENTAL

**Environmental Data**

| | | | | |
|---|---|---|---|---|
| | **Eco-Label Certifications** | This product has received or is in the process of being certified to the following approvals and may be labeled with one or more of these marks:<br><br>US Energy Star ®<br>IT ECO declaration<br>EPEAT Gold where HP registers commercial desktop products. See http://www.epeat.net for registration status in your country US Federal Energy Management Program (FEMP) | | |
| | **System Configuration** | The configuration used for the Energy Consumption and Declared Noise Emissions data is based on a "Typically Configured Notebook" | | |
| | **Energy Consumption** | 115 VAC | 230 VAC | 100 VAC |
| | Normal Operation | 6.95 W | 7.57 W | 7.1W |
| | Sleep (Energy Star low power mode) | 0.93 W | 1.14W | 0.88 W |
| | Off | 0.46 W | 0.61 W | 0.44W |
| | **Heat Dissipation*** | 115 VAC | 230 VAC | 100 VAC |
| | Normal Operation | 24 BTU/hr | 26 BTU/hr | 24 BTU/hr |
| | Sleep | 3 BTU/hr | 4 BTU/hr | 3 BTU/hr |
| | Off | 2 BTU/hr | 2 BTU/hr | 2 BTU/hr |

***NOTE**: Heat dissipation is calculated based on the measured watts, assuming the service level is attained for one hour.

**Declared Noise Emissions (in accordance with ISO 7779 and ISO 9296)**

| System Fan Off | Sound Power (LWAd, bels) | Sound Pressure (LpAm, decibels |
|---|---|---|
| Idle | 3.2 | 29 |
| Fixed Disk (random writes) | 3.3 | 29 |

System fan is usually off except when charging the battery

**Batteries**

This battery(s) in this product comply with EU Directive 2006/66/EC

Batteries used in the product do not contain:

- Mercury greater the 5ppm by weight
- Cadmium greater than 10ppm by weight

The battery type and chemistry used in the product is:
CR2032 (coin cell), Li-ion
6-cell high capacity Lithium-Ion battery (optional 8 cell available)

**Additional information**

This product is in compliance with the Restrictions of Hazardous Substances (RoHS) directive - 2002/95/EC.

This HP product is designed to comply with the Waste Electrical and Electronic Equipment (WEEE) Directive - 2002/96/EC.

This product is in compliance with California Proposition 65 (State of California; Safe Drinking Water and Toxic Enforcement Act of 1986).

This product is in compliance with the IEEE 1680 (EPEAT) standard at the Gold level, see www.epeat.net

Plastics parts weighing over 25 grams used in the product are marked per ISO 11469 and ISO1043.

This product contains 0% post-consumer recycled plastic (by wt.)

This product is greater than 96.4% recycle-able when properly disposed of at end of life.

Packaging Materials

- External:
  - PAPER/Cardboard & misc 411 g
  - PAPER/Corrugated 51 g
- Internal:
  - PLASTIC/Polyethylene low density 25 g
  - PLASTIC/EPE-Expanded Polyethylene 60 g
  - PLASTIC/PET 3 g

- OTHER/OTHER 20 g

- The PAPER/Cardboard & misc packaging material is made from 80% recycled content.
- The PAPER/Corrugated packaging material is made from 80% recycled content.
- The PLASTIC/Polyethylene low density packaging material is made from 65% recycled content.
- The PLASTIC/EPE-Expanded Polyethylene packaging material is made from 65% recycled content.
- The PLASTIC/PET packaging material is made from 65% recycled content.
- The OTHER/OTHER packaging material is made from 65% recycled content.

HP follows these guidelines to decrease the environmental impact of product packaging:

- Eliminate the use of heavy metals such as lead, chromium, mercury and cadmium in packaging materials.
- Eliminate the use of ozone-depleting substances (ODS) in packaging materials.
- Design packaging materials for ease of disassembly.
- Maximize the use of post-consumer recycled content materials in packaging materials.
- Use readily recyclable packaging materials such as paper and corrugated materials.
- Reduce size and weight of packages to improve transportation fuel efficiency.
- Plastic packaging materials are marked according to ISO 11469 and DIN 6120 standards.

## MATERIAL USAGE

This product does not contain any of the following substances in excess of regulatory limits (for reference of these limits please refer to the HP General Specification of the Environment (http://www.hp.com/hpinfo/globalcitizenship/environment/supplychain/gen_specifications.html):

- Asbestos
- Certain Azo Colorants
- Certain Brominated Flame Retardants - may not be used as flame retardants in plastics
- Cadmium
- Chlorinated Hydrocarbons
- Chlorinated Paraffins
- Formaldehyde
- Halogenated Diphenyl Methanes
- Lead carbonates and sulfates
- Lead and Lead compounds
- Mercuric Oxide Batteries
- Ozone Depleting Substances
- Polybrominated Biphenyls (PBBs)
- Polybrominated Biphenyl Ethers (PBBEs)
- Polybrominated Biphenyl Oxides (PBBOs)

Technical Specifications

- Polychlorinated Biphenyl (PCB)
- Polychlorinated Terphenyls (PCT)
- Polyvinyl Chloride (PVC) - except for wires and cables, and certain retail packaging has been voluntarily removed from most applications.
- Radioactive Substances
- Tributyl Tin (TBT), Triphenyl Tin (TPT), Tributyl Tin Oxide (TBTO)

- Nickel finishes that release greater than 0.5 µgrams/$cm^2$/week, measured according to EN 1811:1998, are not used on any product surface designed to be frequently handled or touched by users.

## END-OF-LIFE MANAGEMENT AND RECYCLING

Hewlett-Packard offers end-of-life HP product return and recycling programs in many geographic areas. To recycle your product, please go to: http://www.hp.com/go/reuse-recycle or contact your nearest HP sales office. Products returned to HP will be recycled, recovered or disposed of in a responsible manner.

The EU WEEE directive (2002/95/EC) requires manufacturers to provide treatment information for each product type for use by treatment facilities. This information (product disassembly instructions) is posted on the Hewlett Packard web site at: http://www.hp.com/go/recyclers. These instructions may be used by recyclers and other WEEE treatment facilities as well as HP OEM customers who integrate and re-sell HP equipment.

## HEWLETT-PACKARD CORPORATE ENVIRONMENTAL INFORMATION

For more information about HP's commitment to the environment:

Global Citizenship Report http://www.hp.com/hpinfo/globalcitizenship/gcreport/index.html
Environment website
http://www.hp.com/environment
Eco-label certifications
http://www.hp.com/hpinfo/globalcitizenship/environment/productdesign/ecolabels.html
ISO 14001 certificates:
http://www.hp.com/hpinfo/globalcitizenship/environment/operations/envmanagement.html

Options and Accessories (sold separately and availability may vary by country)

| Type | Description | Part # |
|---|---|---|
| **Memory** | HP 2 GB (DDR3 1333 MHz) SODIMM | AT912AA#xxx |
| | HP 4 GB (DDR3 1333 MHz) SODIMM | AT913AA#xxx |
| | HP 2 GB PC3-12800 (DDR3 1600 MHz) SODIMM | H2P63AA#xxx |
| | HP 4 GB PC3-12800 (DDR3 1600 MHz) SODIMM | H2P64AA#xxx |
| | **NOTE:** Full availability of 4 GB or more of memory requires Windows Vista Business 64-bit or Linux. With Windows 32-bit operating systems, the amount of usable memory is dependent upon your configuration, so that above 3 GB all memory may not be available due to system resource requirements. Due to system limitations, DDR3-1600 MHz memory will only be supported at DDR3-1333 MHz. | |
| **Cases** | HP Essential Top Load Case | H2W17AA |
| | HP Essential Backpack | H1D24AA |
| | HP Essential Messenger Case | H1D25AA |
| **Docking** | HP Display and Notebook Stand | AW662AA |
| | HP 3005pr USB 3.0 Port Replicator | H1L08AA |
| | HP 2005pr USB 2.0 Port Replicator | H1L07AA |
| **Input/Output - Mice** | HP 2.4 GHz Wireless Optical Mobile Mouse | LX732AA |
| | HP Wireless Mobile Mouse | H2L63AA |
| | HP USB Essential Keyboard/Mouse | H2S75AA |
| **Adapters** | HP 90W Slim Adapter | BT796AA |
| | HP 90W Smart AC/Auto/Air Combo Adapter | ED493AA |
| **Storage - External Storage** | HP Mobile USB DVDRW | A2U57AA |
| **Batteries** | HP PR06 Notebook Battery | QK646AA |
| **Health and Education** | HP 20-Notebook Managed Charging Cart | QL489AA |
| | HP 20-Notebook Charging Cart | QL488AA |
| | HP 30-Notebook Managed Charging Cart | QL490AA |
| | HP Pocket Whiteboard | A0X37AA |

## Options and Accessories (sold separately and availability may vary by country)

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